

Suicide Clusters: An Examination of Age-Specific Effects

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Abstract: The age specificity of time-space clusters of suicide was examined using National Center for Health Statistics data for 1978–84. Significant clustering of suicide occurred primarily among teenagers and young adults, with minimal effect beyond 24 years of age. Clustering was two to four times more common among adolescents and young adults than among other age groups. (*Am J Public Health* 1990; 80:211–212.)

Introduction

Approximately 29,000 people killed themselves in 1985 in the United States.* Suicide is rare before the age of 12, increases dramatically during adolescence, and reaches a peak between ages 20 to 24 at which time the suicide rate plateaus until another increase is witnessed among elderly men. Suicide among teenagers and young adults has increased markedly since 1960, moving suicide from the fifth leading cause of death to the second leading cause of death among teenagers in 1985.*

The recent occurrence of several highly publicized clusters of youth suicides has focused attention on the problem of suicide “epidemics”—unusually high numbers of suicides occurring in a small area and brief time period. Such outbreaks have been reported from ancient times through the twentieth century in diverse populations of varied ages,^{1,2} but these reports are difficult to interpret without systematic surveillance and reporting of suicide clusters. Moreover, only recently³ have statistical techniques for the detection of clusters of suicide in time and space been used, although several studies have examined temporal clustering after suicide stories.¹ Few studies have examined temporal fluctuations, in general^{4–7} or spatial patterns.⁷ Some clustering of suicides occurs by chance alone, even if suicides are occurring at random, so measurement of the rate of “outbreaks” must account for the clustering expected by chance variation.

Our earlier work indicated that clustering of suicides occurred among 15–19 year olds to a greater extent than would be expected by chance alone.³ The present report examines the whole life span to determine whether suicide clusters are unique to adolescents or represent a more general phenomenon.

Methods

Data Sources

Vital statistics mortality data tapes 1978–84 were obtained from the National Center for Health Statistics (NCHS). Separate analyses were performed for the following age groups: 15–19, 20–24, 25–29, 30–34, 35–44, 45–54, 55–64, and 75+ years.

A suicide was defined as any individual whose cause of death had been listed as codes E950–959 of the Ninth Revision of the International Classification of Diseases (ICD-9). The late effects of a self-inflicted injury (E959) was included in the analyses because the timing of the death, in addition to the initial suicidal act, may influence a subsequent suicide. However, this classification of death only accounted for up to 0.2 percent of the total number of suicides within any age group and, therefore, it is unlikely that it had an impact on the analyses.

Statistical Method

The Knox procedure⁸ was used to assess the degree of time-space clustering. Details on alternative procedures and the reasons for selection of the Knox procedure are given elsewhere.³ The Knox procedure considers all possible pairs of cases and the time and space distances between them. Critical values for time and space to define “closeness” must be specified in advance. The test statistic involves a comparison of the observed number of pairs close in time and space with the expected number, which is the product of the proportion of pairs that are close in time with the number of pairs close in space. The test statistic approximately follows a normal distribution, $Z = (O-E)/\text{variance}$. The variance of the statistic was estimated following the method of David and Barton.⁹

Definition of Cluster

There are no explicit definitions of a “suicide cluster” in the literature. Initial operational definitions and limits for time and space parameters were examined in an exploratory analysis of NCHS data for 15–19 year olds for 1978 and state mortality data for 1978 through 1985, as described elsewhere.³ Four space units (county and town of residence and occurrence) and five critical time units (3, 7, 14, 30 and 60 days) were examined to define closeness between pairs of cases. Exploratory analyses indicated that county of residence yielded a space unit more sensitive to the definition of a cluster. There was little difference between the five time units in the exploratory examination. The data are reported for 7, 14 and 30 days.

Results

As shown in Table 1, 1,420 close pairs of suicides (same county, 0–7 days) occurred among 15–19 year-olds, whereas 1,339.2 were expected. The 6 percent elevation above chance had an associated p-value of .011. The effect of clustering is primarily observed in the younger age groups (15–19 and 20–24 year olds) at the three critical time units. Very little clustering occurred at older ages, with the exception of the 55–64 year old age group at the seven-day critical time unit.

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*Mortality Statistics Branch, Division of Vital Statistics, National Center for Health Statistics. Vital Statistics of the United States (Unpublished data for 1985).

TABLE 1—Results of Knox Procedure on 1978–1984 NCHS Mortality Detail File

Age (years)	N	Window = 7 Days				Window = 14 Days				Window = 30 Days			
		Close-Close Pairs		O/E	P	Close-Close Pairs		O/E	P	Close-Close Pairs		O/E	P
		Expected	Observed			Expected	Observed			Expected	Observed		
15–19	12135	1339.2	1420	1.060	.011	2756.7	2842	1.031	.047	6000.7	6177	1.029	.009
20–24	25511	6335.5	6523	1.030	.008	13126.1	13481	1.027	.001	28642.6	29602	1.033	.000
25–29	23275	7126.1	7155	1.004	.365	14775.8	14888	1.008	.174	32247.7	32681	1.013	.008
30–34	19534	4805.0	4834	1.006	.338	9991.0	10035	1.004	.328	21794.4	21978	1.008	.106
35–44	29092	9707.5	9822	1.012	.119	20086.4	20271	1.009	.094	43780.9	44066	1.007	.087
45–54	26002	6976.1	7103	1.018	.060	14530.8	14629	1.007	.205	31622.9	31633	1.000	.478
55–64	25624	6399.6	6623	1.035	.002	13277.2	13401	1.009	.136	28928.5	29260	1.011	.024
65–74	19621	3334.8	3395	1.018	.139	6877.7	6976	1.014	.111	15002.1	15247	1.016	.020
75+	14718	2373.0	2367	0.997	.550	4876.8	4888	1.002	.435	10567.0	10554	.998	.551

The effect size was two to four times greater among the adolescents than in other age groups.

Discussion

Suicide clusters appear to occur primarily among teenagers and young adults, although clusters do occur occasionally at other ages. This is consistent with the findings of Phillips and Carstensen¹⁰: the impact of suicide stories on subsequent suicides was greatest for teenagers. In addition, although there is no formal surveillance system for suicide clusters in the United States, most of the suicide clusters reported to the Centers for Disease Control have primarily involved adolescents, young adults, or both.¹

The magnitude of the clustering effect is relatively small, even among teenagers and young adults. Estimates of the percentage of teenage suicides that occur in clusters averages between 1 percent and 2 percent with considerable variation by state and year, yielding a range of estimates from less than 1 percent to 13 percent.³ However, the relative risk for suicide given exposure to the suicide of one or more other persons may be quite great. Studies at the individual level will be needed to define this relative risk. Moreover, although the number of youth suicides that occur in clusters may be relatively small, they represent a class of suicides that may be particularly preventable. Suicide prevention efforts that focus on high-risk populations is a recommended strategy.¹¹

The Centers for Disease Control has recently developed recommendations for a community plan for the prevention and containment of suicide clusters.¹² Targeting multiple risk

groups in prevention strategies will be necessary to reduce the suicide rate substantially.

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